

# CENTER FOR NEURAL INTERFACES

## CENTER

Established in 1995, the Center for Neural Interfaces (CNI) develops systems that enable research into the parallel processing of information by the nervous system. It is well-known that the individual neurons of the nervous system work in an integrated fashion to encode and process sensory information about the world around us, and to generate muscle command signals that enable us to interact effectively with this world. It is only by recording the activity patterns of large groups of neurons that we can begin to understand how sight, hearing, touch, and volitional information is encoded and processed by the brain. CNI is creating the tools that make these investigations possible.

## TECHNOLOGY

CNI has invented silicon-bases with arrays of microelectrodes that can either listen in on or talk directly to hundreds of neurons simultaneously. This can now be done on a chronic basis in awake and freely behaving animals. CNI has developed surgical tools and techniques that allow these high-density microelectrode arrays to be implanted in central and/or peripheral nervous systems. It has also developed data acquisition systems that permit the large amounts of data recorded by these microelectrode arrays to be stored and analyzed in PC-class computers. It has written software that is used to acquire and analyze these neural signals. The long-range goal of the Center is to use these new neural interfaces as therapies for disorders of the nervous system. Ultimately, these systems may provide limited, but functional sensory restoration in individuals with profound blindness or deafness, and enhanced motor function to individuals with high spinal cord injuries.

## ACCOMPLISHMENTS

Several prototypes from new inventions have been developed including a 100 channel neural signal amplifier together with a neural signal acquisition system and software. The development of a flexible micro-ribbon cable for a 12 pin skull connector was completed. A prototype of a high density array (100 um sensor distance) was completed.

**Bionic Technologies, Inc., the Center spin-off company** has undertaken the commercialization effort of the prototypes, developed at the Center, to the international research community. The company has already received two Phase I SBIR awards, a total of \$200,000, and first year sales were estimated at over \$100,000.

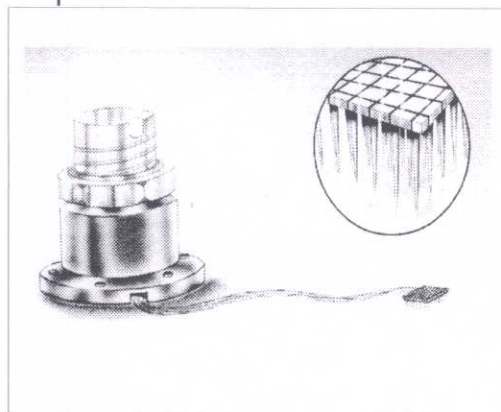
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*Can You Imagine...*

... a miniature camera whose video output is fed to the visual cortex of a sight impaired person to provide artificial vision with sufficient resolution for key object identification?

THE CENTER WAS ESTABLISHED TO TRANSFORM THE NEUROPROSTHETIC TECHNOLOGIES DEVELOPED BY THE MORAN LABORATORIES FOR APPLIED VISUAL AND NEURAL SCIENCE INTO PROTOTYPE SYSTEMS FOR FUTURE CLINICAL APPLICATIONS.



■ The array probe and connecting cable assembly.